

The lightning flash with an arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION - This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules & CE Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING - Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION : To prevent electric shock and risk of fire hazards:

- ◆ Do NOT use power sources other than those specified.
- ◆ Do NOT expose this appliance to rain or moisture.

This installation should be made by a qualified service person and should conform to all local codes.

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■ Features

Auto Iris Vari-focal Built-in Lens

DC Auto Iris Vari-focal Lens is built in.

Horizontal Resolution of 540 TV Lines

Clear image quality has been achieved by employing a SONY CCD with 410,000 (effective) pixels, which provides a horizontal resolution of 540 TV lines.

Excellent Sensitivity

Adopting a Diagonal 6mm (1/3"), highly sensitive CCD and digital signal processing technology, it can clearly distinguish the outline and color of a subject in an extremely low luminance environment. even, for example, under starlight. Since surveillance is possible in places where the light is poor, the camera is appropriate for day and night surveillance outdoors or on the outside of buildings.

Day & Night

The camera identifies whether it is day or night and automatically switches to the appropriate mode, depending on its environment. By day, the camera switches to color mode in order to maintain optimal color. At night, it switches to B/W mode so as to obtain better picture definition.

DNR (Digital Noise Reduction)

The amount of low illuminance noise has been significantly reduced, and the signal-to-noise ratio (S/N ratio) as well as horizontal resolution, have been improved resulting in a clear and sharp image even in low light.

PRIVACY Function

The PRIVACY function conceals the areas not required to appear on the image.

Electronic IRIS

The electronic IRIS function enables continuous automatic control of the shutter between 1/50(60)~1/100,000 seconds.

Programmable GAMMA Processing

VIDEO/DC Drive Lens

The video drive lens and the DC drive lens can be selected by the touch of a switch.

Controlled by OSD Menu

The camera functions are controlled by selecting text displayed on the monitor screen.

Additional Functions

MOTION DETECTION, MIRROR, SHARPNESS and COLOR ADJUST functions are also available.

Warning ■

The camera requires periodic inspection.

Contact an authorised technician to carry out the inspection.

Stop using your camera when you find it malfunctioning.

If the camera emits smoke or is unusually hot for a long period, a fire may be caused.

Do not install the camera on a surface that can not support it.

If the camera is installed on an inappropriate surface, it may fall and cause injury.

Do not hold plug with wet hands.

It could cause an electric shock.

Do not dis-assemble the camera.

It may result in an electric shock or other hazards.

Do not use the camera close to a gas or oil leak.

It may result in a fire or other hazards.

■ Precautions

Do not install the camera in extreme temperature conditions.



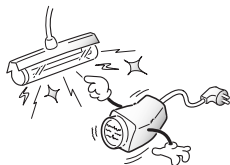
Only use the camera under conditions where temperatures are between -10°C and $+50^{\circ}\text{C}$. Be especially careful to provide ventilation when operating under high temperatures.

Do not install or use the camera in an environment where the humidity is high.



It can cause the image quality to be poor.

Do not install the camera under unstable lighting conditions.



Severe lighting change or flicker can cause the camera to work improperly.

Do not touch the front lens of the camera.



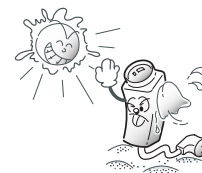
This is one of the most important parts of the camera. Be careful not to leave fingerprints on the lens cover.

Do not drop the camera and protect it to physical shocks.



It can cause malfunctions to occur.

Never keep the camera pointed directly at strong light.



It can damage the CCD.

Do not expose the camera to rain or spill beverage on it.



If it gets wet, wipe it dry immediately. Liquids can contain minerals that corrode the electronic components.

Do not expose the camera to radioactivity.



If exposed to radioactivity the CCD will fail.

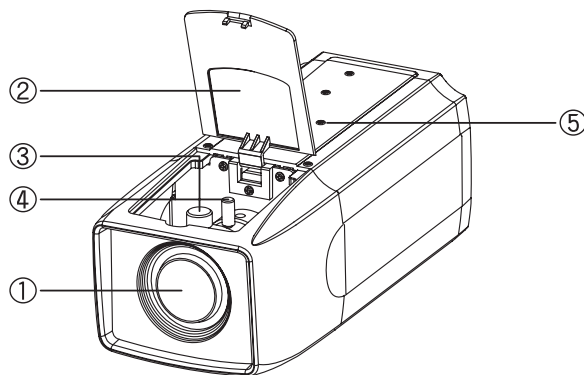


Note

- If the camera is exposed to spotlight or object reflecting strong light, smear or blooming may occur.
- Please check that the power satisfies the normal specification before connecting the camera.

■ Components

Front



① Built-in Lens

Built-in DC Auto Iris Vari-focal lens.

② Front Cover

Used to access focus or zoom handle. After adjusting, be sure to close it.

③ Focus Handle

Used to provide accurate focusing of object within lens field of view.

④ Zoom Handle

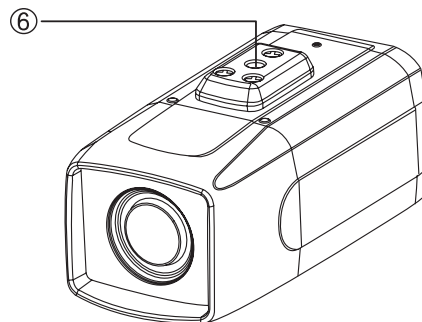
Used to adjust zoom magnification of lens.

⑤ Tripod Mount Bracket Screw Hole

Used to fix the tripod mounting bracket on the top of the camera

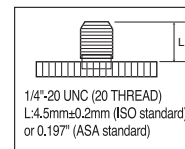
Names and Functions of Parts ■

Top



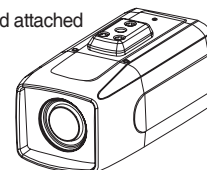
⑥ Mounting bracket screw hole

Please use the screw hole when fixing the camera onto the mounting bracket. Please use the clamp screw as specified picture.



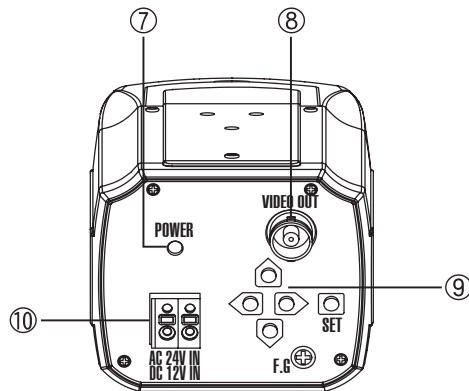
※ The mounting bracket can be separated and attached to the top of the camera.

In this instance please do not tighten the screw to a depth of more than 5mm, otherwise serious damage can occur to the inside of the camera.



Names and Functions of Parts

Rear



7 Power LED

Lights up when the correct power is supplied

8 Video Out Jack

Used to connect an external video Monitor

9 Menu SET Buttons

• SET Button

Used to access menu mode.
Also used to confirm the setting.

• UP & DOWN Buttons

Used to choose the desired menu item.
It also moves the cursor up or down in the menu screen.

• LEFT & RIGHT Buttons

Used to change the parameter of the selected menu item.
It also moves the cursor to the left or right in the menu screen.

10 Power Terminal

Used to connect AC24V or DC12V power source

Installation

Connecting to a monitor

Connect the video output terminal located on the back of the camera to the monitor.

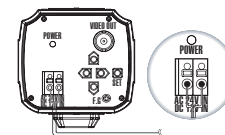


- The connection method varies depending on the type of monitor and accessories. Please refer to the user's manual for each instrument.
- Turn off the power when connecting.

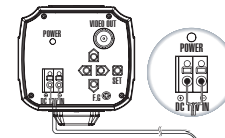
Connecting to power

Check the standard power requirement before connecting to power.

Dual Power Type (AC 24V/DC 12V, AC 24V Class2)



DC Power Type (DC 12V, 500mA)



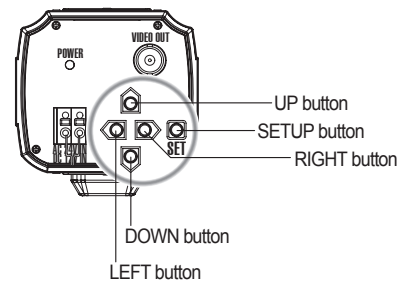
■ Camera Operation

■ Menu

SETUP menu	
LENS (selection)	• MANUAL • DC/VIDEO
EXPOSURE	• SHUTTER • BRIGHTNESS • AGC • SENS-UP • BLC • D-WDR • RETURN
WHITE BAL	• ATW • AWB • AWC • MANUAL
DAY NIGHT	• COLOR • AUTO • EXT • B/W
3DNR	• ON • OFF
SPECIAL	• CAMTITLE • D-EFFECT • RS-485 • MOTION • PRIVACY • LANGUAGE • RETURN • SYNC
ADJUST	• SHARPNESS • BLUE • RED
RESET	• FACTORY RESET • RETURN
EXIT	

■ Settings

Settings can be made using the 5 buttons located on the rear of the camera

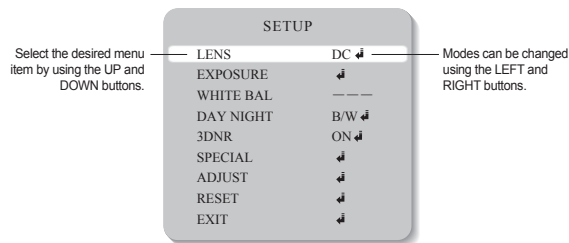


1. Press the SET button
 - The Setup menu is displayed on the monitor screen.

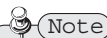
SETUP	
LENS	DC ↕
EXPOSURE	↕
WHITE BAL	— — —
DAY NIGHT	B/W ↕
3DNR	ON ↕
SPECIAL	↕
ADJUST	↕
RESET	↕
EXIT	↕

2. Select a menu item using the Up and Down buttons.
 - Place the cursor over a desired item.


■ How to Use the Camera



3. Set up a selected item by using the Left and Right buttons.
4. To finish and save the settings, select 'EXIT' and press the SET button.



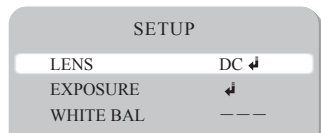
Note

- An item with the  icon also has sub-menus. To select a sub-menu, press the SET button.
- An item with the --- icon has no sub-menus available for selection.

LENS

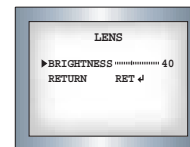
This function is used to adjust the brightness of the screen.

1. When the SETUP menu screen is displayed on the screen, position the cursor to point to LENS using the Up and Down buttons.
2. Select the type of lens using the Left and Right buttons.



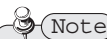
● DC/VIDEO : Auto Iris Lens selection.

- When using an auto iris lens, the setting of the auto iris lens selection switch, located on the back of the camera, must be on DC or VIDEO depending on the type of the lens which being used. (Refer to the picture on page 13)
- The brightness of the screen can be adjusted in DC mode. The brightness can be adjusted within the range of 0 ~100. The optimum level of brightness can be achieved using this adjustment.



● MANUAL : Manual Lens selection.

3. Press the SET button to return to the previous menu.

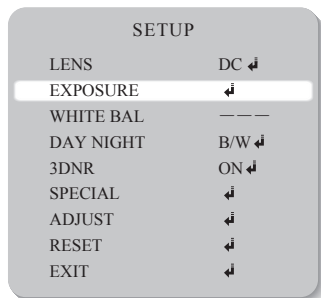


Note

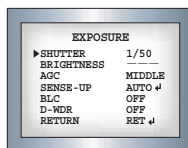
- If you press the Set button in "MANUAL LENS", You can Adjust brightness in EXPOSURE.
- If you press the Set button in "DC/VIDEO", You can't adjust brightness in EXPOSURE, Return to "LENS" and adjust brightness.

■ How to Use the Camera

EXPOSURE



1. When the SETUP menu screen is displayed select EXPOSURE using the Up and Down buttons.
2. Select the desired mode using the Left and Right buttons.



● SHUTTER

1. The shutter speed is controlled manually.
2. Select 'FLK' mode when flickering occurs on the screen due to an imbalance between illumination and frequency.
NTSC Model: 1/100, PAL Model: 1/120

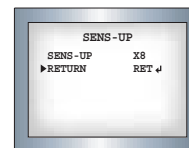
● AGC (AUTO GAIN CONTROL)

The higher the gain level, the brighter the screen - but the higher the noise.
- OFF, LOW, MIDDLE, HIGH can be selected

● SENS-UP

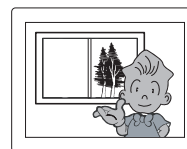
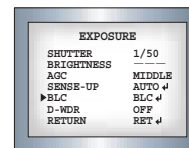
When it is night or dark, the camera automatically detects the light level and maintains a clear picture if this mode is activated.

- OFF : Deactivates the SENS-UP function.
- AUTO : Activates the SENS-UP function.



● BLC (Back Light Compensation)

When there is a strong backlight behind the object, clear images of the background as well as the object can still be obtained by using the BACKLIGHT function.



BLC ON

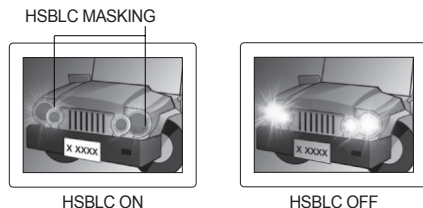


BLC OFF

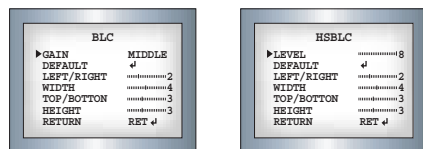
■ How to Use the Camera

● HSBLC (Highlight Suppress Back Light Compensation)

If there is a high light installed in a limited environment such as an apartment parking garage or gas station entrance, removing the high light makes it possible to view car license plates efficiently.

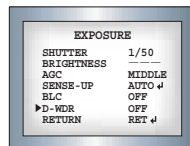


3. Select the desired mode using the Left and Right buttons and press the SET button.



● D-WDR

By DWDR image processing techniques of input image, information of input image brightness value is analyzed, that part of relatively bright and dark images is judged and through different Brightness value mapping will have the effect of improving the contrast ratio. (Please select INDOOR and OUTDOOR to fit the individual environments.)

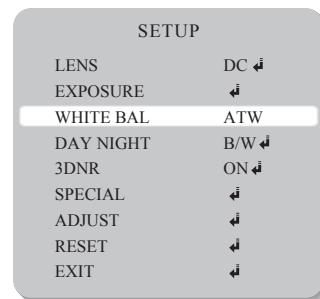


- RETURN : Saves the FUNCTION menu and returns to the SETUP menu.

WHITE BALANCE

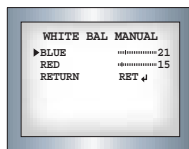
Use the White Balance function to adjust the screen colors.

1. Position the cursor to point to WHITE BAL on the SETUP menu screen, select using the Up and Down buttons.
2. Select the desired mode using the Left and Right buttons.



- ATW(Auto Tracking White Balance) : This mode can be used within the color temperature range 2,000°K ~ 9500°K
- AWB(Automatic White Balance) : This mode can be used within the color temperature range 1,800°K ~ 11,000°K
- AWC SET : To obtain the optimum state under the current luminance levels, direct the camera to point toward a sheet of white paper and press the SET button. If the environment changes, including the light source, the white balance will require re-adjustment.
- MANUAL : The manual adjustment mode enables finer adjustment. Select ATW or AWB first then change to manual adjustment mode and press the SET button. Set the appropriate color temperature then increase / decrease the red and blue colour values and monitor the color changes of the object.

■ How to Use the Camera



Note

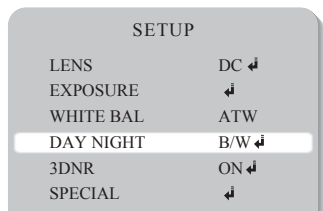
• Under the following conditions White Balance may not work properly. In such cases, select the AWC mode.

- ① When the color temperature of the subject environment has a very high temperature range (e.g. clear sky, or sunset)
- ② When the ambient illumination of the subject is low.
- ③ If the camera is directed toward a fluorescent light, or is installed in a place where illumination changes dramatically, the White Balance operation may become unstable.

DAY/NIGHT

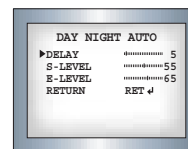
Pictures can be displayed in either color or black and white.

1. When the SETUP menu screen is displayed, select 'DAY/NIGHT' using the Up and Down buttons.



2. Select the desired mode using the Left and Right buttons.

- COLOR : The color mode is selected as the default, and the camera does not change automatically.
- AUTO : This camera has a function which automatically changes to the appropriate mode dependant on lighting levels. COLOR mode is selected during daylight and B/W mode at night time. (Set START LEVEL and END LEVEL manually, as appropriate environment.)



- EXTERN : This mode allows the application of a filter to external signals.
- B/W : Discards the color information and displays in black and white.

Note

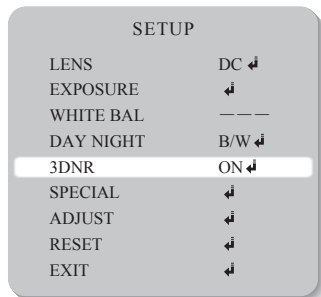
- When using a Video Auto Iris Lens, if the lens level is too low, automatic switching between Color and Black & White may not occur.
- If you press the Set button in "AUTO", AGC is disabled.
- The camera focus will "shift" marginally under infrared illumination at night. Always use an IR Corrective extra-low dispersion lens to obtain sharp pictures in color and monochrome.

■ How to Use the Camera

DNR

This function reduces the background noise in a low luminance environment.

1. When the SETUP menu screen is displayed, select 'DNR' using the Up and Down buttons.



2. Select a desired mode using the Left and Right buttons.
 - OFF : Deactivates DNR. Noise is not reduced.
 - ON : Activates DNR so that noise is reduced.
3. Set the DNR mode to 'ON' and press the SET button. The noise reduction level can now be adjusted.

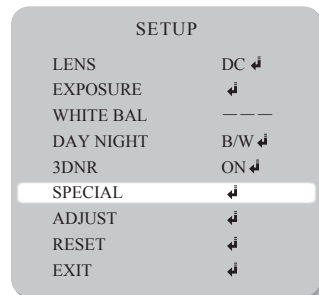


Note

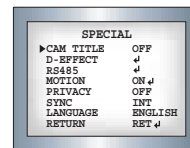
- When adjusting the noise reduction level in DNR mode, remember that the higher the level is set, the greater the reduction in noise level, but it also increases the possibility of ghosting.

SPECIAL

1. When the SETUP menu screen is displayed, select 'SPECIAL' using the Up and Down buttons.

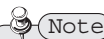


2. Select the desired mode using the Left and Right buttons.



- CAM TITLE: If a title is entered, the title appears on the monitor.

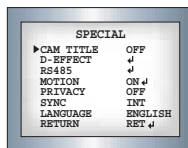
- ① When the SPECIAL menu screen is displayed, use the Up and Down buttons to point the cursor to 'CAM TITLE'.
- ② Set to 'ON' using the Left and Right buttons.



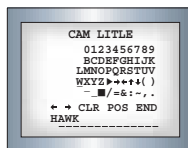
Note

- When the CAM TITLE menu is 'OFF', no title will be displayed on the monitor screen even if one has been entered.

■ How to Use the Camera



③ Press the SET button.



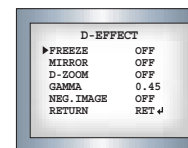
④ Use the 4 directional buttons to move to a character, and select it by pressing the SET button. Repeat this action to enter multiple characters. Up to 15 alphanumeric characters can be used.



Note

- If the cursor is moved to CLR and the SET button pressed, all letters are deleted. To edit a letter, change the cursor to the bottom left arrow and press the SET button. Move the cursor over the letter to be edited, move the cursor to the letter to be inserted and then press the SET button.

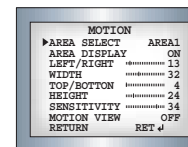
● D-EFFECT



- FREEZE : View still pictures.
- MIRROR : MIRROR,V-FLIP,ROTATE can be selected.
- D-ZOOM : OFF(X1), ON(X2 to X32) can be selected.
- GAMMA : Users can change the gamma setting in 0.5 steps, between 0 and 1.0
- NEG.IMAGE : NEGATIVE IMAGE or POSITIVE IMAGE can be selected.

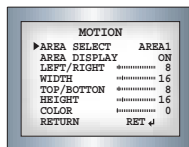
● MOTION DETECTION:

This product has a feature that allows you to observe movements of objects in 4 different areas on the screen, and the green shape appear on the screen when movement is detected; hence a single individual can conduct supervision efficiently. The camera detects an object's movement by sensing disparity of outline, and level of brightness and color.



■ How to Use the Camera

- Please select the area you wish to observe from the 4 areas in AREA SELECT mode.
- Please select ON mode for the chosen area.
- Please adjust the size of the area to be observed by using the LEFT/RIGHT, WIDTH, TOP/BOTTOM, HEIGHT button.
- Please adjust the level of observation by using SENSITIVITY mode.
- Please press the RETURN button to save the changes and complete the setting.
- **PRIVACY** : Hide an area so that it is not displayed on the monitor.
Set up using the 4 directional buttons.
- **AREA SELECT** : Up to 8 areas are selectable.
- **AREA DISPLAY** : Determines whether to use the area selected in the AREA SEL, and the size and position of the area.



- **COLOR** : Determine area color. Select any colors of 16.
- **RETURN** : Select this to save the PRIVACY menu settings and return to the SPECIAL menu.
- **SYNC** : In areas where the supply is 60Hz, synchronisation function (Line-Lock), multiple cameras using the power synchronisation function (Line-Lock), without using a synchronisation signal generator.
- **INT** : Internal Synchronisation Type
- **L/L** : Power Synchronisation Type, Line-lock
 - Press the SET button.
 - Select a phase between 0 and 359.

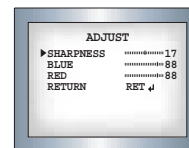


● LANGUAGE

Users can select their preferred language for the OSD menu from either, English, Korean, Chinese (Big5), Chinese (Simplified) or Japanese.

- **RETURN** : Select this to save the SPECIAL menu settings and return to the SET UP menu.

ADJUST



- **Sharpness** : The sharpness of the image can be adjusted using the left and right buttons. (32 steps)
- **BLUE** : The blue color can be increased/decreased using the left and right buttons. (100 steps)
- **RED** : The red color can be increased/decreased using the left and right buttons. (100 steps)

RESET

RESET : Resets the camera settings to the factory defaults.

EXIT

Press the SET button in the EXIT menu to save the current settings and exit the SET menu.

■ Troubleshooting

If you have trouble operating your camera, refer to the following table. If the guidelines do not enable you to solve the problem, contact an authorized technician.

Problem	Solution
Nothing appears on the screen.	<ul style="list-style-type: none"> • Check the power connections. • Check the VIDEO signal line connection.
The image on the screen is dim.	<ul style="list-style-type: none"> • Make sure the lens is clean. Clean the lens with a soft clean lint free cloth. • Adjust the monitor contrast & brightness controls. • Re-position the camera if necessary.
The image on the screen is dark.	<ul style="list-style-type: none"> • Adjust the contrast control of the monitor. • If you have an intermediate device, set the 75Ω/ Hi-z properly.
The camera is not working properly, and the surface of the camera is hot.	<ul style="list-style-type: none"> • Check that an appropriate power source is connected to the camera.
The DAY/NIGHT menu does not work.	<ul style="list-style-type: none"> • Check that AGC in the EXPOSURE menu is set to 'OFF'.
The SENS-UP function does not work.	<ul style="list-style-type: none"> • Check that AGC in the EXPOSURE menu is not set to 'OFF'. • Check that SHUTTER in the EXPOSURE menu is not set to 'FLK' or 'MANUAL'.

Problem	Solution
The Motion Detection function does not work.	<ul style="list-style-type: none"> • Check that MOTION DEF of SPECIAL SETUP menu is 'OFF'.
Color is not correct.	<ul style="list-style-type: none"> • Check the setting of WHITE BAL SETUP menu .
The screen flickers continually.	<ul style="list-style-type: none"> • Check that direction of camera turns toward the Sun.

■ Specifications

MEMO ■

NTSC			PAL		
Power Source		AC24V / DC12V	DC12V	AC24V / DC12V	DC12V
		170mA(AC24V) / 260mA(DC12V)	160mA	170mA(AC24V) / 260mA(DC12V)	160mA
CCD	Size	SONY 1/3" Super HAD High Sensitivity Color CCD			
	Total Pixels	811(H) x 508(V)		795(H) x 596(V)	
	Effective Pixels	768(H) x 494(V)		752(H) x 582(V)	
Scanning System		2:1 Interlace			
Sync	Synchronisation	Internal / Line Lock			
	Frequency	Horizontal : 15.734 KHz, Vertical:59.94 Hz		Horizontal : 15.625 KHz, Vertical:50.00 Hz	
O.S.D		English, Korean, Chinese (Big5) Chinese (Simplified) or Japanese			
E L E C T R I C A L	Back-light Comp.	OFF / BLC / HSBLCL			
	Resolution	540 TV Lines			
	S/N (Y signal)	52 dB (AGC Off, Weight ON)			
	Min. Illumination	0.15Lux(40IRE Color), 0.0006Lux(40IRE Sense-upX256) at F1.2			
	White Balance	ATW / AWB / AWC / Manual			
	Electronic Shutter Speed	1/60 ~ 1/120,000 sec		1/50 ~ 1/120,000 sec	
	Sens-up	AUTO / OFF (Selectable x2 ~ x256)			
	Gain Control	LOW / MIDDLE / HIGH / OFF			
	DNR	ON / OFF			
	Motion Detection	ON / OFF (4 Zone, ALARM Output)			
	PRIVACY	ON / OFF (8 Zones)			
	V-REV	ON / OFF			
	H-REV	ON / OFF			
	FREEZE	ON / OFF			
	SHARPNESS	ON / OFF (Level Adjustable)			
	IRIS Control	DC / Video			
Day & Night	COLOR / Black& White / AUTO / EXT				
Digital Zoom	ON(x32) / OFF				
Lens Mount		CS Mount (Easy Focus type) (C Mount is mountable by using adaptor)			
Operating Temperature / Humidity		-10°C to + 50°C / 30% to 80% RH			
Storing Temperature / Humidity		-20°C to + 60°C / 20% to 90% RH			
Dimension		64.0(W) × 57.4(H) × 115.8(D)mm			
Weight		Approx. 240g			

MEMO

A large rectangular area defined by a dotted border, intended for writing a memo.

Super DNR High Resolution Built-in Lens Color Camera

Instruction Guide



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